Exercise 1: State the primary key of the tblAlbum table.

Exercise 2: State foreign key(s) of tblAlbum table (if any).

Exercise 3: Given the relationship diagram, can an artist have more than one album? Explain why.

Exercise 4: Given the relationship diagram, can an album have more than one artist? Explain why.
Maintenance Form

- **Creating a New form from the Ribbon**
  - A simple maintenance form is built.
  - All the fields from the underlying data source are placed on the form.
  - You can modify it in Layout view or Design view to better suit your needs.
  - A subform is created automatically, based on the relationships identified.

Searching

- **Filtering**
  - Use the search box to locate any customer by name, address phone etc

Example

- **The subform is created automatically**

Types of Queries in Access

- **Select Query**
  - Does not change the data. Is a view of data already contained in database
- **Update Query**
  - Allows us to update tables. Modifies data permanently in database.
- **Make Table Query**
  - Makes a new table and fills it with the selected data. Adds new table permanently to database
- **Add Query**
  - Adds records to an already created table. Adds data permanently to database.
- **Delete Query**
  - Removes data from the database
Select Queries in Design View

1. Select Query Design from Create menu

2. We need to select the tables that we want to add to the query.

3. We can choose the columns and add criteria for filtering the data

4. The exclamation point runs our query.

5. Results

Exercises

Exercise 5: Complete the QBE form below so that the query will return the first name, surname and grade (in that order) of any student that has achieved an A+.

Adding Calculated Fields

We can use the expression builder to create a member discount field.

Results
Detail vs. Aggregate

- **Detail**
  - Default in Access
  - Gives individual, detailed results

- **Aggregate**
  - Group data
  - E.g. sums, averages, counts
  - Selecting the Sigma: \( \Sigma \)
  - Access calls this a "Totals Query"

Aggregate Queries

**Student Information**
- Total number of students obtaining each grade
- Average mark for each lab group

SQL

- **SQL – Structured Query Language**
  - (pronounced “sequel”)
  - Developed by IBM in the 1970s
  - Standard language used for databases

- **SELECT statement:**
  - Selects rows from a table.
  - We can specify which table and which fields we want to select.
  - We can also group or sort the data and do some calculations.

- **General syntax**

- **Case sensitivity**
  - SQL is case insensitive.
  - It only matters when comparing values in a textual field of the database

```sql
SELECT [comma separated field list] FROM tableName;
```
Examples

- **Select all**
  - SELECT * FROM TableName;

- **Selecting three fields**
  - SELECT field1, field2, field3 FROM TableName;
  
  uses square brackets when names contain punctuation such as spaces

- **Sorting**
  - SELECT field1, field2 FROM TableName ORDER BY field2;
  
  SELECT Name FROM Students ORDER BY DateOfBirth;

WHERE Clause

- **Comparison operators:** =, >, <, <=, >=, <=
  - WHERE [City] = 'Auckland';

- **BETWEEN ... AND ...**
  - WHERE Price BETWEEN 10 AND 20;

- **LIKE**
  - WHERE [City] LIKE 'San *';

- **IN (list)**
  - WHERE [City] IN ('Auckland', 'Wellington');

- **AND, NOT, OR with any of the above**
  - WHERE [country] = 'New Zealand' AND City = 'Auckland';

- **IS NULL, IS NOT NULL**
  - WHERE [ZIP/Postal Code] IS NOT NULL;

More Examples

- **Constraining**
  - Numeric fields do not need quotations
  - Text fields use a single quote

  - SELECT field1, field2, field3 FROM TableName WHERE field1>3;
  - SELECT field1, field2, field3 FROM TableName WHERE field2='Paul';

SQL in Access

- **Adding a table name**
  - Used as a qualifier when we have multiple tables
  - Avoids confusion

- **Format**
  - tableName . tableField

- **Example**
  - SELECT Students.[First Name], Students.City FROM Students WHERE Students.City='Auckland';
Exercise 6: Write the SQL command that will return the first name, surname and grade (in that order) of any student that has achieved an A+.

Exercise 7: Write the SQL command that would return the surnames and ID numbers of the students, ordered according to their total marks.

Creating Reports using Access

- **Report Button (basic)**
  - Displays all the fields from the underlying table or query
- **Report Wizard**
  - Create reports from data in our database.
  - Fastest way to create a report.
Grouping the Data

- A group is a collection of records, along with any introductory and summary information displayed with the records, such as a header.

Modifying the Report

- We can use Design Mode to modify the reports layout.